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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,580	01/31/2006	Mitsuru Yamamoto	Q92973	5128
23373	7590	10/29/2008	EXAMINER	
SUGHRUE MION, PLLC			STIMPERT, PHILIP EARL	
2100 PENNSYLVANIA AVENUE, N.W.				
SUITE 800			ART UNIT	PAPER NUMBER
WASHINGTON, DC 20037			3746	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,580	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Philip Stimpert	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 17 July 2008.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-9, 12-16, 19 and 20 is/are rejected.
 7) Claim(s) 10, 11, 17, 18, 21 and 22 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 31 January 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____ .

DETAILED ACTION

Claim Objections

1. Claims 10 and 17 are objected to because of the following informalities: both claims recite “and to introduce bubbles” and “and to collect the introduced bubbles.” It appears that “and” should be deleted in all four instances. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 7, 8, 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Each of these claims recites a dimension which is “continuously” diminished in two directions simultaneously. Further definition is required to prevent these limitations from describing physically impossible layouts.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Grosjean et al. (US 6,520,753).

7. Regarding claim 1, Grosjean et al. teach a diaphragm pump comprising a pressure chamber (21, 22, 23) formed into a flat shape (as shown in Figs. 1-2 particularly) and filled with liquid (col. 2, ln. 23-25), a suction side flow passage (24) at a left end of the pressure chamber (21, 22, 23) and a discharge side flow passage (26) at the right end of the pressure chamber (21, 22, 23). The axes of the flow passages may be considered to be aligned in several senses. The vertical sections of these passages are substantially parallel, which constitutes a form of alignment. Furthermore, there are also coaxial sections of these passages interfacing directly with the pressure chamber ends (21, 23). Grosjean et al. also teach a groove (namely the pressure chamber itself) formed in the peripheral wall of the pressure chamber (21, 22, 23) for accelerating a flow of the liquid downstream (as part of the pumping action of the diaphragm pump generally). Finally Grosjean et al. teach a diaphragm (14) comprising a lower surface of the pressure chamber (21, 22, 23) and oscillating to vary the volume of the pressure chamber (col. 2, ln. 57-61).

8. Regarding claim 2, the pressure chamber of Grosjean et al. has a section (particularly chamber 23) formed in the upper surface of the pressure chamber into which the liquid flows and a side part (to the right of 23, communicating with outlet 26) with an opening opened to a peripheral wall surface (the right side of 26) from which the liquid is discharged downstream in the flow direction.

9. Regarding claim 3, Grosjean et al. teach that the pressure chamber (21, 22, 23), and thus the groove, is generally linear. Thus if a point is selected within the groove somewhere in the vicinity of the discharge port, the groove will extend from that point,

and may thus be considered to extend in a radial direction. Therefore, and in light of the indefiniteness of this claim as noted above, it is assumed that Grosjean et al. meet the limitations of claim 3.

10. Regarding claim 4, Grosjean et al. teach that the axes of the flow passages are positioned substantially at the center of the cross-sectional shape of the pressure chamber in a surface orthogonal to the axes, as is shown in Figs. 2 and 8 particularly.

11. Regarding claim 5, as shown in Figs. 1, 2, and 8, Grosjean et al. teach that each cross-sectional shape of the pressure chamber (21, 22, 23), the suction side flow passage (24), and the discharge side flow passage (26) in surfaces orthogonal to the axes are formed in an approximate rectangle.

12. Regarding claim 6, as shown in Fig. 1, Grosjean et al. teach that the lower surface (14) of the pressure chamber (21, 22, 23) is the same surface as the lower surfaces of the suction and discharge side flow passages.

13. Regarding claims 7 and 14, as shown in Fig. 2, Grosjean et al. teach that the length of the pressure chamber (21, 22, 23) viewed from an upper surface in a direction orthogonal to the axes is shortened as it approaches the side flow passages.

14. Regarding claims 8 and 15, as shown in Fig. 1, Grosjean et al. teach that the height of the pressure chamber (21, 22, 23) is continuously lowered toward the side flow passages (see the inclines indicated at 21 and 23 particularly).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 9, 12, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grosjean et al. in view of Bishop et al. (US 6,042,345).
17. Regarding claims 9 and 16, as detailed above, Grosjean et al. substantially teach the limitations of claims 1, 2, and 6. Grosjean et al. do not teach the use of valves in the pump. Bishop et al. teach a diaphragm pump which utilizes inlet and outlet check valves (28, 30) in order to ensure unidirectional flow through the pump. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use check valves as taught by Bishop et al. in order to ensure unidirectional flow through the pump of Grosjean et al.
18. Regarding claims 12 and 19, Bishop et al. teach the use of piezoelectric elements (12) to drive piezoelectric oscillators and to thereby create a pumping action. It would be obvious to substitute the piezoelectric actuation of Bishop et al. for the thermopneumatic actuation of Grosjean et al. as a matter of ordinary skill in the art.
19. Claims 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grosjean et al. in view of Wegeng et al. (US 5,611,214).
20. Regarding claims 13 and 20, Grosjean et al. substantially teach the limitations of claims 1, 2, and 6. Grosjean et al. do not teach a closed-structure flow passage. Wegeng et al. teach microcomponent sheet architecture in general, and particularly teach several closed-structure flow passage, such as that shown in Fig. 5a, in which circulating liquid is discharged from a pump (507) discharge side (toward 501) and

returned to the suction side (from 503). This would indicate to one of ordinary skill in the art that the pump of Grosjean et al. could be used in a heat-pump apparatus as taught by Wegeng et al. which would include a closed structure flow passage.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a pump as taught by Grosjean et al. in a closed-structure flow passage as taught by Wegeng et al. in order to provide a heat-pump system.

21. Claims 10, 11, 17, 18, 21, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter: the limitation of an intake and sealed space for the respective introduction and collection of bubbles is not shown in the prior art of record.

Response to Arguments

23. Applicant's arguments filed 17 July 2008 have been fully considered but they are not persuasive.

24. The previous informalities and indefiniteness were corrected, however with the newly added and examined claims 6-22, new grounds of objection and indefiniteness have been found, and are treated above.

25. With respect to obviousness, the applicant argues that "Grosjean does not disclose or suggest 'grooves' as recited by claim 1." However, claim 1 merely recites "at least one groove." There appears to be no language in claim 1 which precludes the interpretation taken by the examiner, thus the rejection is maintained.

Conclusion

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Stimpert whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

/P. S./
Examiner, Art Unit 3746
24 October 2008